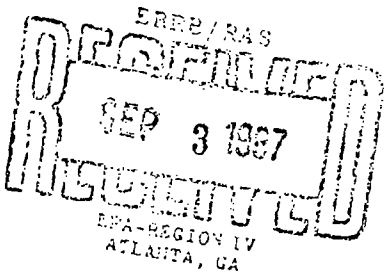
3.4

3 4 00116



FINAL REPORT
DATA MANAGEMENT PLAN
BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA

Prepared For

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	353
EPA Region	:	IV
Site No.	:	4B15
Date Prepared	:	August 27, 1987
Contract No.	:	68-01-7331
CDM Federal Programs Corporation Document No.	:	T353-C04-FR-AZFC-2
Prepared By	:	Versar, Inc.
Work Assignment Project Manager	:	Scott Slagley
Telephone Number	:	(404) 873-2137
Primary Contact	:	Michelle Glenn
Telephone Number	:	(404) 347-2643

TAIØ-56

TABLE OF CONTENTS

FIGURES

1.0 INTRODUCTION

This document presents the data management program to be utilized during the collection of data for the completion of the Bluff Road Remedial Investigation/Feasibility Study (RI/FS). The data management plan addresses the organization of technical (i.e., field and laboratory measurements) and project tracking (i.e., financial and technical progress) data, as well as management of data for specific tasks. The procedures in this document are necessary to insure that the data obtained during the RI will be of sufficient integrity to be utilized in the FS or in any future legal action which may occur.

2.0 DATA MANAGEMENT PROCEDURES FOR TECHNICAL DATA

2.1 Documenting Field Measurements and Observations

All field measurements, such as pH, temperature, conductivity, etc., will be recorded in either project log books, field data records, or a similar type of recordkeeping book. All data will be directly entered in the field, signed, and dated. If entry changes are made, one line will be drawn through the error and the change and an explanation will be signed and dated in the book. All field data records will be organized into standard format when possible and retained in permanent files.

2.2 Sample Identification and Chain of Custody

Field samples will be identified by a sample tag or another appropriate label. The following information will be recorded with indelible ink on the tag: date and time of sampling, sampling location or station with cross-reference to a sampling plan, name of the sample collector, and any additional comments that are applicable. Copies of the sample tags will be kept in a permanent file maintained for the site.

2.2.1 Field Sample Custody Procedures

Sample custody will be initiated at the time of sample collection by placing the labeled sample into an iced cooler in the possession of the sampling technician. A line item on the field chain of custody form (Figure 1) will be immediately filled out and initialed by the sampling technician. A field chain of custody form is necessary to assure custody of samples during transport and shipping to the analytical laboratory. Upon completion of all line items, or upon sample pickup, the monitoring specialist will sign, date, and list the time, and will confirm the

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME					PARAMETERS								INDUSTRIAL HYGIENE SAMPLE Y / N
SAMPLERS: (Signature)					(Printed)									
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS								REMARKS

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow), Copy to Coordinator Field Files (pink)

FIGURE 1
FIELD SAMPLE
CHAIN OF CUSTODY RECORD

completeness of all descriptive information contained on the form. Each individual who subsequently assumes responsibility for the samples will sign the chain of custody form and indicate the reason for assuming custody (e.g., transport to central field office). The field chain of custody form terminates upon laboratory receipt of samples.

2.2.2 Laboratory Sample Custody Procedures

From the moment a sample is collected until the final assessment is complete, custody of the sample must be controlled. Custody will be routinely maintained on all samples. Sample custody is maintained in the laboratory by ensuring that one of the following conditions exists at all times:

- The sample is in the actual possession of an authorized laboratory staff member.
- The sample is in the view of any authorized laboratory staff member.
- The sample is placed in a secure location, after being in the possession of an authorized laboratory staff member.
- The sample is kept in a secured area which is restricted to authorized laboratory staff members.

A designated sample custodian will be initially responsible for samples received at the laboratory. This individual will be fully aware of all custody requirements and potential hazards. In addition to receiving samples, the sample custodian will also be responsible for

documentation of sample receipt, storage before and after sample analysis, and eventually the proper disposal of samples. An assistant sample custodian will be assigned to assist the sample custodian in the performance of all duties in the event the sample custodian is absent.

All samples will be inspected the moment they enter the laboratory. Any breakage or other damage will be documented and brought to the attention of the laboratory manager. If samples arrive in an acceptable state, this will be noted on the appropriate documents. An explanation of damage will be provided for those samples received in some unacceptable condition. All documentation related to the samples will be filled out, signed, and dated by the sample custodian. Field chain of custody forms sent with all samples will be signed by the sample custodian and a copy provided to the task manager.

Samples will be identified by appropriate information attached to the sample bottle (i.e., field numbers, sample tags, sample labels). Sample information on the field chain of custody will then be verified against the sample bottle information by the sample custodian to ensure the accuracy and completeness of all documentation.

Information concerning samples will be logged into the laboratory automated sample management system and will include the following:

1. unique laboratory number;
2. field sample number;
3. project/batch number (assigned by laboratory project manager);
4. sample matrix;
5. parameter(s) of interest;
6. sample receipt date/time;

7. sample location in laboratory;
8. sample custodian initials;
9. sampling site or organization; and
10. sample/batch comments

The sample custodian will place the samples in assigned storage areas prior to analysis. The assigned area for each batch will be clearly identified with project and batch number. The actual location will be documented on parameter request forms.

After completion of sample analyses and the shipment of the batch data report, samples will be boxed and removed to the laboratory storage area. Samples will be stored at appropriate temperatures for three months before being discarded. Provisions for longer storage periods will be made if required.

2.2.3 Final Evidence Files

Originals of all field chain of custody forms and laboratory analytical reports will be maintained in a designated, secured area in the laboratory. Copies of these forms and reports will also be maintained in the permanent project file. All records will be maintained for a minimum period of five years.

All field documentation developed during the site investigation will also be maintained until field activities have been completed. Upon completion of the site investigation, all field documentation will be maintained in the project files for a minimum period of five years.

2.3 Document Control, Inventory, and Filing Systems

2.3.1 Data Management

A member of the project team will be designated to establish and maintain the document control system for the duration of the investigation. Data obtained in this project and selected appropriate data from published reports or other sources (which meet quality assurance criteria), will be screened and validated to identify and reject outliers or errors. The data will then be prepared, sorted, and entered (either computerized or manually) into the data storage files for the project. The document inventory/filing system will be based on serially numbered documents and will be protected from any intentional or accidental destruction or damage.

The project files and all data generated during the RI/FS become part of the administration record for the site. The administrative record is required by SARA and is utilized in the choosing of a remedy(s) at the site. Therefore, the administrative record is the agency's legal documentation of RI/FS related decisions and activities, and will be utilized if judicial review of RI/FS actions are necessary.

2.3.2 Data Reduction, Validation, and Reporting

All data obtained in the conduct of this project will be validated by Quality Assurance/Quality Control (QA/QC) Methods and internal peer review.

Data generated in the field, for example, soil and groundwater quality measurements, will be reviewed by another technically qualified specialist for completeness of records, calibration logs, and consistency of data with known physical-chemical principles. The reviewer will be responsible for resolving any questions in the data and will initial and date the data reviewed.

Data generated by the analytical laboratory will be checked daily by routine methods for both internal consistency and transmittal errors by the assigned quality control supervisor. The supervisor will perform routine QA/QC method checks, and if errors are observed they will be corrected and documented. The analyst performing the task will be notified, in writing, of errors. The final analytical data reports from the laboratory will be submitted to the task manager for his review and acceptance of the data in terms of completeness with respect to technical requirements of the project.

All chemical results will be tested to determine if any values are statistically different from the complete set. Suspect results will be rejected from the data set only if the test statistic indicates the suspected result lies in the 95th percentile or greater, or 5th percentile or less, of a normal distribution.

All data generated during the sample collection and analysis will be centralized into one project file. This includes completed logs and carbon copy pages of the chemists' work notebook, including sample weights, dilutions, concentrations, data reduction, instrument logs, and all raw data. The project file will also include all instrumental data as well as the sample injection sheets. The injection sheets will contain information about the instrument conditions. This data management system will allow for easy review of material by the quality assurance officer and senior chemists.

3.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

3.1 Quality Assurance Objective

The QA objective for the remedial investigation (RI) establishes the guidelines which define the quality of the environmental measurements required to meet the objectives of the remedial investigation study. This section will address objectives for precision, accuracy, completeness, representativeness, and comparability.

Samples of soil sediment, surface water, and ground water will be collected to document the nature and extent of contamination and contaminant pathways. During the field sampling activities, a field blank and a sample duplicate for every ten samples of a matrix type (solids and liquids) will be collected. Field blanks will always be prepared on-site. Additionally, trip blanks will be prepared by the analytical laboratory and transported to the field. These samples will be submitted to the laboratory to assess the quality of the data resulting from field sampling activities. Duplicate samples will be analyzed to check sampling and analytical reproducibility. Blank samples will be analyzed to check for procedural contamination and/or ambient conditions at the site that may result in sample contamination.

The QA objectives for laboratory analytical precision, accuracy, and sensitivity are to achieve the QC acceptance criteria for the proposed analytical procedures. For the organic and inorganic constituents procedures, the precision and accuracy guideline requirements will be specified. Specific method sensitivities will be presented for the chemical analyses. Soils will be tested using applicable EPA Region IV procedures.

The data produced during the site investigation will be compared with the QA objectives and criteria for precision, accuracy and completeness to verify that they meet those objectives and criteria. The data assessment activity will be an ongoing process coordinated with data production, and is intended to assure that all data produced in the project are acceptable for use in subsequent evaluations. If the data are acceptable, they are released to the data management system. If they are not, corrective action is taken.

3.2 Quality Assurance of Data Evaluation and Engineering Analysis

The quality control procedures applied to data evaluation and engineering analysis activities include the following:

- Original interpretations and calculations will be checked by the author and by a professional associate with comparable training and experience.

- Original work will then be reviewed by the Project Manager or his designee for accuracy, clarity, and conformance with accepted professional standards of the technical discipline.

- The interpretations and calculations will again be scrutinized as part of the normal report review process by the Quality Assurance Officer, professional associates not associated with the project, and a technical editor.

- o In situations involving new hypotheses or experimental results, the work would be peer-reviewed by professional scientists and engineers to ensure data interpretations have been properly made.

The technical quality control procedures for evaluations and engineering analysis will provide assurance that the technical reports prepared meet the standards and objectives of the project. All technical reports will be prepared by members of the technical staff who have an understanding of the project and the outputs required.

Upon completion of the required technical reports and before they are released as final drafts an additional quality assurance measure will be implemented. All reports will be reviewed by the Project Manager for overall quality and consistency with the RI/FS project objectives prior to their submittal. The technical activity manager is responsible for technical content, accuracy, and completeness. After the draft is completed, an evaluation of technical content is conducted by an independent review team. All activities of the report review process will be documented and reported as quality control documentation.

3.3 Field Quality Control

All field activities will be performed following EPA recommended sampling protocols which are used by EPA and industry on a nationwide basis. These sampling protocols provide for samples to be collected in a uniform manner throughout the project and ensure that all samples have similar integrity. Samples will be preserved following EPA protocols and maintained at $4^{o}C$ until the analyses are performed. In most cases, samples will be shipped the same day they are collected.

As part of standard field sampling procedures, three types of QC samples will be collected from the field at a rate of one per 10 samples for the following samples:

- Trip Blank - One trip blank for every 10 samples of each general category of organic parameters will be prepared with deionized water, preserved with appropriate agent, transported to the site, handled like a sample, and returned to the laboratory for analysis.

- Field Blanks - Field blanks will be prepared in the field to ensure contamination is not introduced from media other than that being sampled (i.e., contamination of ground-water by airborne contaminants). Field blanks may be collected by transferring deionized water into the appropriate sample containers in the field, preserving the sample, and shipping the samples to the laboratory for analysis. Field blanks may also include equipment blanks which ensure a sampling device (e.g., bailer or pump) has been effectively cleaned. The sampling device is filled with deionized water or deionized water is pumped through the device, transferred to the appropriate sample bottles, preserved, and returned to the laboratory for analysis. One field blank will be collected for every 10 environmental samples collected.

- Blind Duplicates - Two sets of samples from a single source will be prepared, labeled with unique sample numbers, and submitted to the laboratory without cross-referencing data and without identification as duplicates on the parameter request sheet.

The results of analyses of these QC samples will be used as independent, external checks on laboratory and field contamination, and the precision of analyses.

3.4 Laboratory Quality Control

To obtain data on laboratory precision, accuracy, and recovery, laboratory control samples will be analyzed at a rate of one per batch of samples for each matrix type (e.g., water, soil) and concentration level (e.g., low, medium) or one per 20 samples, whichever is more frequent. The control limits and corrective actions will be specified.

- Duplicate samples - to check laboratory and sampling precision.
- Spiked sample - to check the recovery of parameters of interest, including any chemical interference from the sample matrix.
- Laboratory or method blank - to check for laboratory contamination.

For organic analyses of soil and water involving Gas Chromatograph/Mass Spectrophotometer (GC/MS), the following analyses will also be required. The control limits and corrective actions will be specified.

- A method blank will be analyzed every 12 hours of continuous operation for volatile organic compounds.
- Surrogate spike analysis will be run on every sample. The surrogate spikes are unusual organic compounds that are readily identified in the analysis. Surrogate spikes are used to check the recoveries on purging or extraction.

- Matrix spike/matrix spike duplicates will be analyzed at a rate of one per batch of samples for each matrix type (e.g., soil, water) and concentration level (e.g., low, medium) or one in 20 samples, whichever is more frequent. The matrix spike consists of a mixture of standard organic compounds among the volatile, base/neutral extractable, acid extractable, and pesticide groups. The matrix spike is used to check on matrix interferences in the recoveries of compounds in purging or extraction.

For inorganic analysis of soil and water, the following QC analyses will also be required. The control limits and corrective actions will be specified.

- Calibration Verification using EPA reference materials directly following instrument calibration and after every tenth sample thereafter through the working day.

- Laboratory Blank Verification at instrument calibration and after every tenth sample thereafter through the working day to check instrument drift.

- Preparation Blank analysis at a rate of one per batch of samples for each matrix type (e.g., soil, water) and concentration level (e.g., low, medium) or one per 20 samples of a single matrix, whichever is more frequent, to determine contamination levels during preparation.

- Interference Check of sample analyses at the beginning and end of each analytical run to verify Inductively Coupled Plasma (ICP) inter-element correction factors.

The following laboratory sample records will be maintained by the laboratory.

- Sample receiving logbook - to log the samples when they are received and assigned a batch number.

- Instrument logbook - to record the use and maintenance of analytical instruments.

- Standards logbook - to record the preparation and use of all standards in the laboratory.

- QC logbook - to record all day-to-day QC data obtained from the analysis of a batch. Quality control summary sheets are used as a convenient method to file batch QC information by parameter.

- Chemist's notebook - to record the raw data and final data for every batch.

- Quality control charts - to trace the performance on individual analyses and instruments, and to give an early indication of analyses that may be going out of control.

4.0 DATA MANAGEMENT REQUIREMENTS FOR SPECIFIC TASKS

4.1 Data Management for Site Characterization and Sampling

To provide records and documentation on the site characterization and sampling activities, the following plans will be in place prior to the commencement of any site work and sampling: (1) work plan, (2) a site specific sampling plan, (3) QA/QC plan, and (4) health and safety plan. These plans will provide details for all site work.

4.2 Data Management for Health and Safety Programs

A health and safety plan will be in effect prior to the commencement of any RI/FS activities. The health and safety program documentation will include the following:

- o Physicians' reports;
- o Site visitors' log;
- o Personnel monitoring results;
- o Incident reports;
- o Non-conformity reports;
- o Site safety officers' log;
- o Equipment calibration logs; and
- o Personnel training documentation.

Data from the health and safety records for individuals working at the site will be stored for more than 30 years, if so requested by EPA. This long-term document storage may help determine if an employee's poor health in later years is related to exposure to hazardous materials.

4.3 Data Management for Institutional Issues

In depth documentation is necessary for steps needed to resolve issues of site access; RI/FS coordination with Federal agencies, state agencies, other EPA offices, local authorities, and responsible parties; and community relations planning.

This documentation is required in the event that EPA, or its representatives, are presented with any legal challenges related to the RI/FS, or a reconstruction of events is necessary in the feasibility study or at some time in the future.

4.4 Data Management for Bench- and Pilot-Scale Studies

A separate comprehensive data management plan will be completed before the initiation of any bench- or pilot-scale studies. This plan will be detailed and will provide sufficient information to allow for the design or selection of remedial technologies.

The data management plan will contain the following:

- o Statement of objectives;
- o Detailed work plan with specific tasks, cost estimates, and time schedule;
- o QA/QC procedures;
- o Procedures for data collection, validation, reduction, storage and transfer;
- o Rationale for remedial technology selection or rejection.

5.0 FINANCIAL AND PROJECT TRACKING

Financial and project tracking data are essential to the effective management of the RI/FS. However, the RI/FS may be conducted by EPA contractors, state contractors, or responsible parties, and therefore one set of procedures will not encompass the data collection, reporting, and tracking approach that may be utilized during the RI/FS.

The management of the project may be simplified by generation of the following documents:

- Work plan detailing estimates of costs, man-hours, and a time schedule for each task.

- Project tracking reports, both financial and technical, which describe the expenditures and progress associated with the RI/FS activities.

REFERENCES

1. United States Environmental Protection Agency, June 1985, Guidance on Remedial Investigations Under CERCLA. EPA/540/G-85/002.